

Tiny particles may bring ultra-efficient catalysts

Argonne has begun developing a process that could allow large-scale production of nano-sized metal and metal-alloy catalysts, materials made of tiny clusters of atoms just one to 10 nanometers across but displaying extraordinary new properties.

Current methods result in clusters ranging from three to hundreds of nanometers in diameter. A grain of sugar, for comparison, is about 100,000 nanometers across.

Catalysts, used in many industrial processes, are materials that modify or speed up a chemical change in other substances without being consumed in the process.

Nanoparticle catalysts have been reported to be 60 times more active than comparable catalysts prepared by conventional techniques. This higher activity results from the larger surface area of the smaller particles; more catalyst comes in contact with the material being processed.

Harnessing the high activity of nanoparticles for catalytic processes in the chemical and refining indus-



YIELD AHEAD ? — Nanoparticle catalysts could improve the yield of gasoline and other useful hydrocarbons from each barrel of oil.

tries would be a major breakthrough.

Higher activities for known catalysts would improve the yield of plastics and gasoline, improve hydrodesulfurization, and boost the efficiency of hydrocracking (breaking down heavy hydrocarbons to more completely use each barrel of oil). Moreover, less catalyst would be needed for current production levels, so producers could cut their inventories of expensive precious-metal catalysts.

The problem is that current laser systems for making nanocatalysts are feasible only for producing research quantities. However, Argonne's microwave-powered, plasma-chemical process could operate continuously, unlike laser systems, and would require less energy.

Furthermore, the process produces particles in one step, rather than the several steps required by conventional methods. These advantages should make it feasible to scale up the microwave process to industrial quantities.

Argonne would like to form a partnership with end users and suppliers of catalysts to develop this process to industrial scale. The new technology has been used to produce microgram quantities of metal particles as small as 6.0 nanometers and metal-alloy particles as small as 1.56 nanometers, smaller than most other recent nanocatalysts.

Argonne scientists working on this project are John Harkness (ES) and Chris Marshall (CMT).



RACE FOR THE FUTURE — Energy Secretary Bill Richardson gets behind the wheel of an all-aluminum hybrid electric vehicle. Richardson visited Argonne-East Sept. 25. More photos appear on page 2.

Richardson dedicates R&D center

Continued funding for transportation research was promised by Secretary of Energy Bill Richardson during his Sept. 25 visit to Argonne-East.

During his visit he dedicated the Transportation Technology R&D Center — which combines the pieces of the lab's transportation research expertise into one center — and also announced an environmental breakthrough which should enable diesel engines to operate more efficiently and pollute less.

This breakthrough technology controls fuel and oxygen levels in diesel engines — the most efficient internal combustion engines — and reduces particulate levels and decreases nitrogen oxide emissions. Nitrogen oxide — NOx — is a precursor to ozone and contributes significantly to smog. Engine power is increased as well. Before now, researchers have had to choose between reducing either NOx or particulates.

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Combined Appeal begins with clothing drive

The Argonne Combined Appeal will kick off its 1997 campaign with a clothing drive on Monday and Tuesday, Oct. 5-6.

Donations of clean, wearable clothing will be collected from 7:30 a.m. to 5:30 p.m. Monday, and from 7:30 a.m. to 2:30 p.m. Tuesday in the lobby of Argonne-East's Building 213 Cafeteria.

Men's, women's and children's clothing will be accepted.

Children's clothing is especially needed. Donations are tax deductible.

Clothing will be donated to four Combined Appeal agencies: Proviso Association for Retarded Children (a United Way Crusade of Mercy organization); the Alliance for the Mentally Ill of DuPage County; Fish, Inc., a clothing and food pantry; and Little City Foundation.

The Combined Appeal provides

employees with a way to contribute to the Metropolitan Chicago United Way/Crusade of Mercy, United Way Will County and 18 other charities. Employees will receive information from division coordinators on how to donate during the month of October.

More information on the campaign is available on the ACA home page at <http://www.anl.gov/ACA/aca-home.html>.

Appreciation

Interim Laboratory Director Frank Fradin chats with people at the Coordinators Appreciation Coffee hosted last week by the Argonne Combined Appeal (ACA) steering committee. "The effort we put into the Argonne Combined Appeal each year says much about Argonne's heart," Fradin said. This year's campaign will kick off with a clothing drive on Monday and Tuesday, Oct. 5-6. *Photo by George Joch*



Inside this issue

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Energy Secretary Richardson visits ANL-East

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"This exciting, new clean diesel discovery is a major finding of the Department's new Transportation Technology R&D Center here at Argonne — a center which blends public- and private-sector talents and resources in pursuit of national goals," said Richardson. "This center, this development and this teamwork form a model for 21st century research and development."

Argonne Engine Research Facility engineers worked to develop the technology with Electro-Motive Division of General Motors (EMD) and the Association of American Railroads (AAR). This technology is expected to be more cost-effective than alternative exhaust control systems currently being developed.

Richardson also visited the Advanced Photon Source and the Cave Automatic Virtual Environment during his visit. He was also part of a demonstration of how a DOE2000 computer networking research project — the Materials MicroCharacterization Collaboratory — can be used in education. Students from a Chicago high school joined Richardson in the Argonne Information Center to investigate the atomic structure of a computer chip using an Argonne microscope controlled via the Internet. Microscopist Nestor Zaluzec (MSD) led the lesson via phone from Pittsburgh.

— Evelyn Brown



SUPER SPELUNKING — Above, Energy Secretary Bill Richardson (left) gets a demonstration of the CAVE virtual reality system from Matt Szymanski, a grad student working in the Futures Lab (center) and MCS Director Rick Stevens. All photos by George Joch.



TOURING — At left, Richardson gets a tour of the Structural Biology Center at the Advanced Photon Source, hosted by Andrzej Joachimiak (CMB). At right, Richardson sees a demonstration of "telepresence microscopy" at the Argonne Information Center with the help of DEP Director Harold Myron and Esther Young of Chicago's John F. Kennedy High School.



John Schiffer is honored by academy



Schiffer

John Schiffer, senior physicist and associate director of Argonne's Physics Division, has been elected a fellow of the American Academy of Arts and Sciences, recognizing his distinguished contributions to his profession.

He was formally welcomed to the Academy at an Induction Ceremony and dinner at the House of the Academy in Cambridge on Oct. 3. The academy is an honorary society that recognizes achievement in the natural sciences, social sciences, arts, and humanities. The organization conducts a varied program of projects and studies responsive to the needs and problems of society.

Schiffer, who holds a joint appointment as professor of physics at the University of Chicago, has been the recipient of numerous awards and honors, including the American Physical Society's Bonner Prize and Yale University's Wilbur Cross Medal.

He is a Fellow of the American Association for the Advancement of Science, the American Physical Society, the National Academy of Sciences and the European Physical Society.

Free flu shots offered at both Argonne sites

Free flu shots, which reduce the chance of acquiring influenza infection, will be offered to all current Argonne and DOE employees at both Argonne sites.

At Argonne-East, flu shots will be offered Oct. 5, 6, 8, 9, 12, 13, 20, 22, 26, 27 and 29. Vaccinations will be given to registered employees from 3 p.m. to 4:30 p.m. at the Medical Dept., Building 201. To register, contact the Medical Department at ext. 2-2813.

Employees planning to participate in Argonne-East's fall blood drive on Oct. 26 should get their flu shots after donating blood.

At Argonne-West, flu shots will be offered at the Dispensary each Wednesday through Oct. 28, from 10 a.m. to noon and 1-3 p.m.

HR offers a wide variety of classes in October

Human Resources will hold classes in a variety of subjects in October at Argonne-East, ranging from preventing sexual harassment to English as a second language.

Full class descriptions and printable enrollment forms can be found on the Human Resources World Wide Web Home Page at <http://www.anl.gov/HR/home.html>, under "Performance Development."

To register, contact a division Training Management System representative. For more information,

call Betty Iwan (HR) at ext. 2-3410.

■ Preventing Sexual Harassment for Supervisors (HR140) — Thursday, Oct. 15, from 9 - 10:30 a.m. in Building 201, Room 190. The class is free.

■ Getting Your Message Across (HR234), a brown bag lunch seminar — Friday, Oct. 16, from 11:30 a.m. - 1 p.m. in Building 201, Room 238. The cost is \$40.

■ CPS Review: Management (HR261) — Tuesday, Oct. 20 - Thursday, Nov. 19, from 11:30 a.m. - 1 p.m. in Building 201, Room 238.

Cost is \$210.

■ English As A Second Language (HR534) — Wednesdays and Fridays, Oct. 21 - Jan. 8, from 11:30 a.m. - 1 p.m. in Building 201, Room 238. The cost is \$375, which includes textbooks. A \$30 pretest is required for all new participants.

■ Facilitating Effective Meetings (HR636) — Thursday, Oct. 22 from 1-5 p.m. in Building 201, Room 274.

■ Preventing Sexual Harassment for Non-supervisors (HR137) — Tuesday, Oct. 27, from 1:30 - 3 p.m. in Building 201, Room 190. The class is free.



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Argonnet The information source for Argonne employees
<http://www.anl.gov/OPA/argonnet/>

Free screenings offered at Oct. 15 'Health Fair'

All of the laboratory's health-care vendors will be represented at "Health Fair '98," on Thursday, Oct. 15, from 11 a.m. to 3 p.m., in the Argonne-East Building 213 Cafeteria.

CIGNA, RushPrudential, HMO Illinois, Medex, PCS (prescription drugs), the Argonne Medical Department and Argonne's Employee Assistance and Wellness programs will

be present to explain their services and to answer employees' questions.

Free cholesterol and diabetes tests, body fat analysis and blood pressure checks will be available.

Tickets available to see IHL champion Wolves

The Argonne Club will host an outing to a Chicago Wolves hockey game — the team's first game of the season — at the Rosemont Horizon on Saturday, Oct. 10.

Play begins at 7 p.m. The Wolves

won the International Hockey League championship last year; the evening will include the presentation of the Turner Cup, the league's championship trophy.

Tickets are \$17, and will be sold

in Argonne-East's Building 213 Cafeteria the weeks of Sept. 28 and Oct. 5 from noon to 1 p.m. Bus transportation to and from the game is \$3; the bus leaves the cafeteria parking lot at 5:30 p.m. sharp.

Seminars

Send seminar listings to Evie Fagan, Building 201, Room 2U-09 (OPA-201). Deadline is 5 p.m. Monday. Seminar listings *only* can be sent by e-mail to efagan@anl.gov. Note new e-mail address.

Monday, Oct. 5

Chemistry Division Monday Morning Seminar Series: **"Chiral Electrons in Atoms and Molecules"** by Roger Hegstrom, Department of Chemistry, Wake Forest University, Winston-Salem, N.C. 11 a.m., Bldg. 200 Auditorium.

Intense Pulsed Neutron Source Division Seminar: **"Scaling Properties of Cracks in Heterogeneous Materials"** by Elisabeth Bouchaud, O.N.E.R.A. (DMMP/MS), France. 11 a.m., Bldg. 360, Conference Room B203.

Intense Pulsed Neutron Source Division Seminar: **"Soft Matter and Neutron Scattering: Why Do They Blend So Well?"** by Yuri Melnichenko, Oak Ridge National Laboratory, Tenn. 1:30 p.m., Bldg. 360, Conference Room A224.

Greater Chicagoland Particle Theory Meeting: **"M-Theory and the Light Cone"** by Joseph Polchinski, ITP, Santa Barbara, Calif. 2:30 p.m., Bldg. 203 Auditorium.

Intense Pulsed Neutron Source Division Seminar: **"Plasma Window for Transmission of Particle Beams and Radiation from Vacuum to Atmosphere"** by Ady Herscovitch, Brookhaven National Laboratory. 2:30 p.m., Bldg. 360, Conference Room A224.

Physics Division Seminar: **"Open Problems at the Interface Between Heavy Flavor Physics and Handwaving QCD"** by Harry J. Lipkin, Weizmann Institute, Rehovot, Israel, Tel Aviv University & ANL. 3:30 p.m., Bldg. 203, Conference Room R150.

Greater Chicagoland Particle Theory Meeting: **"QCD on a Laptop: The Fall and Rise of Lattice QCD"** by G. Peter Lepage, Cornell University, Ithaca, N.Y. 4 p.m., Bldg. 203 Auditorium.

Tuesday, Oct. 6

Chemistry Division Seminar: **"Path Integral Simulations of Condensed Materials"** by Kelsey M. Forsythe, Department of Chemistry, University of Illinois, Urbana, Ill. 11 a.m., Bldg. 200, Conference Room J193.

Wednesday, Oct. 7

Materials Science Division Special Colloquium: **"Local Structure of Real Materials: From Catalytic Support Oxides to Superconductors"** by Takeshi Egami, Department of Materials Science & Engineering, University of Pennsylvania, Philadelphia. 11 a.m., Bldg. 212, Conference Room A157.

Joint Chemistry and Materials Science Divisions Seminar: **"Theoretical Study of Silicon Oxidation"** by Krishnan Raghavachari, Lucent Technologies, AT&T Bell Labs, Murray Hill, N.J. 2 p.m., Bldg. 200, Conference Room J183.

Physics Division Atomic & Molecular Physics Seminar: **"Going Beyond Standard X-ray Scattering Theories: When Is It Necessary?"** by Richard H. Pratt, University of Pittsburgh, Penn. 3:30 p.m., Bldg. 203, Conference Room R150.

Friday, Oct. 9

Physics Division Colloquium: **"The Top Quark, from Discovery to Present"** by Robert Roser, Fermi National Accelerator Laboratory, Batavia, Ill. 11 a.m., Bldg. 203 Auditorium.

Additional seminars appear on the Argonne News World Wide Web site:
<http://www.anl.gov/news.html>

Computer Users plan meeting

Argonne's Computer Users Group will meet Tuesday, Oct. 6 at 3 p.m. in Argonne-East's Building 203 Auditorium.

The agenda includes discussions of:

■ "Laboratory Management Plan," by Kathryn Macal (IPD)

■ "Laboratory Year 2000 Resources," by Paul Krystosek (ECT)

■ "Laboratory Year 2000 Test Center," by John Volmer (ECT)

Discover Award entries wanted

Argonne entries are wanted for the *Discover* magazine Award competition.

The Discover Awards honor inventors of innovative science and technology from corporate, academic and government research organizations. Five finalists are chosen in each of several categories.

The finalists attend the Discover Awards weekend in Orlando, Fla., where winners are announced at an evening ceremony at Epcot Center. Finalists' expenses for the weekend are paid by *Discover* magazine.

For more information, visit the Industrial Technology Development Center Web site at <http://www.itd.anl.gov/>, and click on the link for "Internal Information." Employees may also contact Shari Zussman (ITD) at ext. 2-9124, or send e-mail to zussman@anl.gov.

Argonne won *Discover's* "environmental technology of the year" award this year for a new technology for producing an environmentally benign industrial solvent. A near-frictionless coating developed in the Energy Technology Division was a runner-up in the "emerging technologies" category.

Marriott to hold 'Book Fair USA'

"Book Fair USA," a book sale sponsored by Sodexho Marriott, will be held Thursday, Oct. 8, and Friday, Oct. 9, from 11 a.m. to 3 p.m. in Argonne-East's Building 213 Cafeteria.

More than 250 titles will be offered in several genres, including general interest, sports, culinary and children's books.

Cash, checks and major credit cards will be accepted.

Lab-university scholarship applications wanted

Applications are now being accepted for the University of Chicago/Argonne Scholarship Plan.

The program gives the sons and daughters of full-time laboratory employees a chance to compete for full-tuition scholarships to the university.

Children of regular, full-time Argonne employees are eligible. Applicants must be accepted for freshman-level admission to the College of the University of Chicago and must be among the most qualified applicants from Argonne families, as judged by the university.

Information booklets and applications for the scholarship are

available from the Division of Educational Programs (DEP) in Argonne-East's Building 223, Room M125 or by calling Carol Reynolds (DEP) at ext. 2-4114.

The scholarship applications must be validated by DEP to be accepted by the university and should be received no later than Dec. 1.

The University of Chicago/Argonne Scholarship Program does not replace the tuition remission program. For information on the tuition-remission program, call Human Resources at ext. 2-3410.

For information on University of Chicago admissions, call (773) 702-3436.

Information session

An information session for prospective students and their parents will be held Saturday, Oct. 25, from 2 p.m. to 4 p.m. in the university's Ida Noyes Hall, 1212 E. 59th Street. Ted O'Neill, dean of admissions, will discuss selecting a college or university, the application process and financing. A question-and-answer period and tour of the campus will follow.

Call ext. 2-4114 by Monday, Oct. 19, to make a reservation.

For more information on the session, call the university's Jessica Marinaccio at (773) 702-3436.

Legal Dept. debuts new Web page

Argonne's Legal Department now has its own site on the World Wide Web, giving employees access to information about the organization's services, employees and mission.

The site includes information on invention and software reporting, employment and labor law issues, protection of intellectual property, and many other issues.

The site also has links to DOE directives that apply to Argonne and contract performance measurement information, information formerly posted on the Office of Performance Management Web site. (OPM's site will be discontinued.)

To see the Legal Department's Web site, go to Argonne's home page (<http://www.anl.gov>), click on "Divisions" in the right-hand column and then "Legal Department."

Classified Ads

ARGONNE-WEST

1994 JEEP — Grand Cherokee, excellent condition, full-time 4 wheel drive, all the extras. \$14,900 o.b.o. Hank Houser, (208) 522-3366.

MISCELLANEOUS

BICYCLE — Girls, Huffy "Glamour Girl", 20", purple & pink, excellent condition. \$40. Dennis Tussing, (630) 969-3231.

GARAGE SALE — Oct. 9 & 10, 9:30 a.m. – 4 p.m., tape cabinet, lamps, end tables, metal clothes closet, bicycles, Princess & Peace beanie babies. Diane Redman, (815) 293-0272.

HARDWARE, SOFTWARE — Elsa, "Gloria Synergy", 3D & 2D graphics accelerator card, software bundle included. Best offer. Eddie Davis, (708) 757-3560.

MISCELLANEOUS — Briggs & Stratton lawn mower. \$50. Kroehler dresser w/mirror & glass top, old but nice. \$25. Nightstand w/glass top. \$10. Card table. \$10. Decorative mirror, 3-piece w/clock. \$25. Hurricane style light fixture. \$35. 2, gold chairs, upholstered, swivel. \$30/each. Lawn chairs. \$3 - \$8. Estate sale, call & ask about what you need. Paul Kurpis, (630) 971-1322.

GARAGE SALE — 6440 S. Austin Ave., Chicago, Oct. 3 only, household items, furniture, clothing, tools, TV's, everything must go. Isabella Krashak, (708) 430-1817.

MISCELLANEOUS — Precor Treadmic, 4 months old, 10 pre programs, power incline, internal training. New \$2000 – asking \$1,300. Dan Ng, (630) 769-8745.

STEREO SYSTEM — Carver, power, amp, pre-amp, CD player, turner & cassette player, pair of M&K speakers & subwoofer, pair of infinity 3-way speakers. \$2,000. David Huynh, (630) 769-8745.

MISCELLANEOUS — Sony ES series stereo system, power amp, pre-amp, pair of Boss G01 speakers. \$950. Aquariums, complete set-up, 10 gal. \$20. 20 gal. \$40. 55 gal. \$110. David Huynh, (630) 769-8745.

GARAGE SALE — Sat. Oct. 3, 10 a.m. – 3 p.m., 357 Meadowlark Drive, Bolingbrook, Bloomfield Village Subdivision on Lily Cache & Schmidt. Baby, children & woman's maternity clothes, accessories, miscellaneous items. Larry Kurek, (630) 226-0535.

WEDDING DRESS — Worn once by mistake, must see. New \$1,000 – asking \$500 o.b.o. photo available. Veil also. New \$450 – asking \$150. Amanda Propp, (708) 460-4377.

Classified ad request forms are available in stockrooms, at the Office of Public Affairs in Building 201, and at Argonne-West's Building 752, Room D109. The old half-sheet forms are acceptable, but note that the deadline is incorrect. Deadline for classified ads is **5 p.m. Monday.**

Requests can be submitted by fax to ext. 2-5274, or by inter-office mail to Evie Fagan, Building 201, Room 2U-09 (OPA-201). A drop-off box is located at the *Argonne News* office, Building 201, room 2Q-02 and at 2U-09.

Request forms must be signed and must include a home phone number. Ads cannot be accepted by phone or electronic mail. Please limit ads to 25 words; longer ads may be edited. Housing listed for sale or rent is available without regard to race, creed, color or national origin.

Argonne-West employees are welcome to submit classified ads to *Argonne News*. Request forms are available at the office of Argonne-West Correspondent Dolores Lagerquist, Building 752, Room D109. When completed, fax the request form to the *Argonne News* office at (630) 252-5274.

AUTOMOBILES

1989 HONDA — Civic sedan LX, AT, AC, 116K miles, excellent condition. \$3,000 o.b.o. Bob Johnson, (708) 349-0763.

1986 MAZDA — 626, 2-door, AT, PS, PB, PM, PW, cruise, power sun roof, AM/FM cassette, runs great, new resonating pipe, battery, starter motor, exhaust pipe, muffler changed in '97. \$1,500. Subhendu Ghosh, (630) 960-2889.

HOUSING

HOUSE/SALE — 3 bedroom ranch, full finished basement, 4926 Prospect Avenue, Downers Grove. \$174,900. Sandra Bittner, (630) 968-4112.

TO BE GIVEN AWAY

MINIATURE SCHNAUZER — 8 years old, prefer at-home person, Heidi wants a lot of love. Diane Redman, (815) 293-0272.

WANTED

ROOMMATE — To share home, M/F, 10 minutes from lab, 3 bedrooms, 2.5 car garage, 2 baths. \$475 & .5 utilities. Grant Spooner, (708) 781-7293.

PAPER CUTTER — Hand operated, shear type, any size. George Dusatko, (708) 788-4016.

FAX MACHINE — Reasonable. Evie Fagan, (630) 960-5563.

MISCELLANEOUS — Honda Trail 70, running or not, or any CT70 parts. John Wozniak, (708) 614-4763.

LAWN MOWER — Looking for manual lawnmower, good condition. Tami Bohnen, (708) 425-5941.

Safety-shoe samples on display Oct. 13

A mobile unit from IronAge, Argonne's new safety shoe vendor, will be at Argonne-East every Wednesday beginning Oct. 7.

From 8 a.m. to noon, it will be in Argonne-East's Building 200/203 parking lot, located at Inner Circle and Westgate Road; and from 1–4:30 p.m. at Building 360.

Shoe samples may be seen in the Building 213 Cafeteria on Tuesday, Oct. 13, from 11 a.m. to 2 p.m., at which time the vendor will learn the needs and hazards encountered by prospective wearers.

For more information, call Debbie Dedo (PFS-MAT) at ext. 2-4939.

Need information about Benefits? Travel? Publications? Cafeteria menus? Telephone services?

Argonnet

<http://www.anl.gov/OPA/argonnet/>